

Claim Amendments

This listing of claims will replace all prior versions, and listings, of the claims in the application.

Listing of Claims

1. (canceled)
2. (currently amended) A ~~method data packet~~ as defined in claim 5, wherein said layer identifier allowing to distinguish between identical labels having switching significance in different layers of the data network.
3. (canceled)
4. (canceled)
5. (currently amended) A In a network device, a method of transmitting a data packet ~~implemented on a computer readable storage medium for transmission in a data network~~ having one or more layers, comprising:
 - a) transmitting a label stack, said label stack including one or more labels on the basis of which the data packet can be switched in the data network, each label having a switching significance in one or more of the layers of the data network;
 - b) transmitting at least one layer identifier associated with ~~at least one~~ each label in said label stack;
wherein said layer identifier allowing to determine in which layer of the data network the at least one label has a switching significance;
~~wherein said label stack includes a layer identifier associated with each label in said label stack;~~ and
 - (c) transmitting including a key associated with each layer identifier, said key capable to acquire different values, said key permitting to distinguish between layers having identical layer identifiers.

6. (currently amended) A method ~~data packet~~ as defined in claim 5, wherein said key is a single bit flag.

7. (currently amended) A method ~~data packet~~ as defined in claim 8, wherein said label stack is of variable size allowing entities in the data network processing the data packet to push labels in said label stack and pop labels from said label stack.

8. (currently amended) A method ~~data packet~~ as defined in claim 5, including transmitting an address of an entity in the data network at a layer of the data network to which the data packet is destined.

9. (currently amended) A method ~~data packet~~ as defined in claim 8, wherein the address is an IP address and wherein step (b) comprises transmitting a plurality of layer identifiers associated with a plurality of labels in said label stack.

10. (currently amended) A method ~~data packet~~ as defined in claim 5, including a payload.

11. (canceled)

12. (currently amended) A computer program product ~~data packet~~ as defined in claim 15 wherein, said layer identifier allowing to distinguish between identical labels having switching significance in different layers of the data network.

13. (canceled)

14. (canceled)

15. (previously presented) A computer program product tangibly embodied in a computer readable storage medium storing software containing instructions, which when executed by a switching controller of a network entity, causes said network entity to create a data packet embedded in a signal for transmission in a data network having one or more layers, said instructions, comprising:

a) instructions for creating a label stack, said label stack including one or more labels on the basis of which the data packet can be switched in the data network, each label having a switching significance in one or more of the layers of the data network;

b) instructions for creating a ~~at least one~~ layer identifiers associated with each ~~at least one~~ label in said label stack; ~~wherein~~ said layer identifier allowing to determine in which layer of the data network the at least one label has a switching significance; ~~wherein~~ said label stack includes a layer identifier associated with each label in said label stack; and

(c) instructions for including a key associated with each layer identifier, said key capable to acquire different values, said key permitting to distinguish between layers having identical layer identifiers.

16. (currently amended) A computer program product ~~data packet~~ as defined in claim 15, wherein said key is a single bit flag.

17. (currently amended) A computer program product ~~data packet~~ as defined in claim 15, wherein said label stack is of variable size allowing entities in the data network processing the data packet to push labels in said label stack and pop labels from said label stack.

18. (currently amended) A computer program product ~~data packet~~ as defined in claim 15, including an address of an entity in the data network at a layer of the data network to which the data packet is destined.

19. (currently amended) A computer program product ~~data packet~~ as defined in claim 18, wherein the address is an IP address and wherein ~~step (b)~~ said instructions for creating a layer identifier comprises instructions for creating a plurality of layer identifiers associated with a plurality of labels in said label stack.

20. (currently amended) A computer program product ~~data packet~~ as defined in claim 15, including a payload.

21. (canceled)

22. (canceled)

23. (canceled)

24. (previously presented) A network entity as defined in claim 33, wherein said switching controller does not effect the switching of the given data packet when said switching controller ascertains that the label contained in the given data packet has no switching significance in the layer of the data network to which the network entity is associated.

25. (canceled)

26. (canceled)

27. (canceled)

28. (previously presented) A network entity as defined in claim 33, wherein the data packet contains a layer identifier associated with each label in the label stack.

29. (previously presented) A network entity as defined in claim 33, wherein said switching controller is capable to push a label in the label stack.

30. (currently amended) A network entity as defined in claim ~~33~~29, wherein when pushing a certain label in the label stack said switching controller also inserting a layer identifier in the given data packet associated with the certain label.

31. (previously presented) A network entity as defined in claim 33, wherein said switching controller capable to pop a label from the label stack.

32. (currently amended) A network entity as defined in claim ~~33~~31, wherein when popping a certain label from the label stack said switching controller also removes a layer identifier from the given data packet associated with the certain label.

33. (previously presented) A network entity for use in a data network for label switching data packets, the data network having one or more layers and said network entity being intended to be associated to at least one of the network layers, said network entity comprising:

- a) one or more input ports for receiving data packets to be label switched;
- b) one or more output ports for releasing data packets from said network entity;
- c) a switching controller for switching a given data packet received at one of said input ports to one of said output ports on a basis of a label contained in the given data packet, said switching controller operative to ascertain if the label contained in the given data packet has a switching significance in the layer of the data network to which the network entity is associated-;

wherein the given data packet has a label stack, the label contained in the given data packet being in the label stack; and

wherein said switching controller ascertains if the label contained in the given data packet has a switching significance in a layer of the data network to which the network entity is associated on a basis of at least one of a plurality of layer identifiers contained in the label stack;

wherein said switching controller completing the switching of the given data packet when said switching controller ascertains that the label contained in the given data packet has a switching significance in the layer of the data network to which the network entity is associated; and

wherein the given data packet includes a key associated with the layer identifier, said switching controller capable to distinguish between data packets containing identical layer identifiers associated with respective labels at the same position in the respective label stacks of the data packets, on the basis of the keys associated with the layer identifiers.

34. (original) A network entity as defined in claim 33, wherein said switching controller is capable to alter the key associated with a layer identifier in a data packet.

35. (original) A network entity as defined in claim 34, wherein said network entity is located at a logical boundary between a first network operator and a second network operator, wherein the second network operator is capable of terminating a first layer of the data network implemented by the first network operator by overwriting a key in a data packet associated with the identifier of the first layer with a value of key corresponding to a layer implemented by

of the second operator.

36. (original) A network entity as defined in claim 34, wherein said network entity is located at a logical boundary between a first network operator and a second network operator, wherein said network entity is capable of overwriting a key in a data packet associated with an identifier of a first network layer managed by the first network operator with a value indicating that the layer identifier is not valid within a network layer managed by the second network operator.

37. (previously presented) A network entity as defined in claim 33, wherein said network entity is an LSR.

38. (previously presented) A method for label switching data packets in a data network having one or more layers, said method comprising:

- a) receiving a data packet at a location in the data network associated with at least one of the layers of the data network, the at least one layer being a first layer, the data packet containing at least one label;

- b) ascertaining if the label has a switching significance in the first layer;

- c) switching the data packet at said location on the basis of the label if said ascertaining indicates that the label has a switching significance in the first layer;

- wherein the data packet has a label stack comprising a plurality of labels, said switching being performed on a label in a topmost position in the label stack;

- wherein said ascertaining is performed on a basis of information contained in the data packet;

- wherein the information contained in the data packet is a layer identifier associated with the label in the topmost position in the label stack; and

- wherein the data packet includes a key associated with the layer identifier, the key allowing to distinguish between data packets containing identical layer identifiers associated with respective labels at the same position in the respective label stacks of the data packets, on the basis of the keys associated with the layer identifiers.

39. (original) A method as defined in claim 38, comprising precluding label switching the data packet when said ascertaining indicates that the label has no switching significance in the first

layer.

40. (original) A method as defined in claim 39, comprising declaring an error in connection with the data packet.

41. (canceled)

42. (canceled)

43. (canceled)

44. (previously presented) A method as defined in claim 38, wherein said ascertaining comprises comparing the layer identifier with an identifier of the first layer.

45. (previously presented) A method as defined in claim 38, comprising pushing a label in the label stack.

46. (previously presented) A method as defined in claim 38, comprising popping a label from the label stack.

47. (canceled)

48. (canceled)

49. (canceled)